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MINERALOGY OF RADIOACTIVE PEGMATITE ORE FROM GETTY MINES LTD.

S. KAIMAN

MINERALOGY SECTION
PHYSICAL SCIENCES LABORATORY

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MINERALOGY OF RADIOACTIVE PEGMATITE ORE FROM GETTY MINES LTD.

by

S. Kaiman

SUMMARY

Uraninite, uranothorite, eschynite and allanite are present in the granitic ore. A Zyglo penetration test showed that the broken ore is intensely fractured.

INTRODUCTION

On December 21, 1978 the author received a telephone request from Mr. F. Clyde Lendrum for mineralogical work to be done for Getty Mines Ltd. on a uranium-bearing pegmatitic granite from Lac Kachiwiss, just north of Sept Isles, Quebec. The purpose of the work was to identify the radioactive minerals and to make a penetration test on the ore.

A sample was received on January 19 and the work on this project, MSL No. 024172, was approved on January 22, 1979. The sample consisted of four lumps of ore, two of them being fist-sized and the other two somewhat larger: the largest measured approximately 7½ x 14 x 25 cm.

PROCEDURE

Autoradiographs were prepared of the specimens and the radioactive minerals were identified by X-ray diffraction analysis. One end of the largest specimen was flattened for the penetration test made with Zyglo penetrant oil.

OBSERVATIONS

The rock in the specimens is granite or pegmatite and consists mainly of colourless quartz and white to pink plagioclase feldspar. Minor to trace amounts of other minerals are present

including magnetite, biotite, chlorite, cyrtolite, apatite and the radioactive minerals.

The radioactive minerals identified are eschynite, allanite, uranothorite and uraninite. Eschynite occurs in two of the specimens as small, resinous, prismatic to flat, brown crystals, up to 5 mm in maximum dimension and closely associated with magnetite. One of the specimens contains most of the allanite, uranothorite and uraninite. The allanite is very weakly radioactive and occurs as tabular, vitreous to dull, black crystals, up to 1 cm in maximum dimension. The largest allanite crystals often show radial fracturing of the surrounding gangue. Uraninite occurs as black cubic crystals, usually less than 2 mm in size and with submetallic lustre. The uranothorite is usually altered to honey-brown material which splinters with a conchoidal fracture; it is closely associated with the allanite or uraninite. Because of the small number of specimens available, no attempt was made to determine the relative amounts of the radioactive minerals.

The large specimen used for the Zyglo test is a light coloured siliceous rock, partly red-stained and contains a large proportion of feldspar. It contains very little radioactivity. After the specimen had stood on the flat base immersed in Zyglo to a depth of 3-4 mm for 14 days, its surface had become wetted to the top of the specimen, i.e., to a height of 23 cm. Examination of saw cuts of the specimen, made at heights of approximately 7½ cm and 15 cm above its base, under ultraviolet light revealed an intense network of fine fractures covering most of the area of the cuts.

CONCLUSIONS

The extensive fine fracturing of the rock revealed by the Zyglo test and the radial fracturing around the larger allanite crystals indicate that the rock would probably be easily penetrated by leaching solution. The refractory nature of eschynite to acid solution may have to be considered in order to achieve good uranium extraction from this ore.

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